PHYS 302 Intermediate Electrodynamics

Objectives: To learn the fundamentals of classical electromagnetism: electrostatics, magnetostatics, electrodynamics, electromagnetic waves, radiation, and special relativity, and to gain experience with related mathematical topics, especially vector calculus, differential equations, special functions, and tensor analysis.

Course Credit: 4 semester hours
Meeting Times: Tuesday, Thursday; 9:40-11:00 am, with an additional problem session Tuesday; 3:10-4:30 pm
Classroom: fully online via zoom for lectures and problem sessions
Format: A lecture course with weekly problem sets, a take-home midterm exam, and a scheduled final exam.
Course web page: Canvas

Textbook: *Introduction to Electrodynamics*, fourth edition, David J. Griffiths, Pearson/Addison-Wesley (2012) or Cambridge University Press (2017)

Course Instructor:
Wei Li
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Problem Session: In these sessions, we will work through example problems and occasionally take up a topic that is not covered in class, and also discuss some of homework problems.

Office Hours: Monday 4:30pm-5:30pm or at other times by (email) appointment.

Grader (late homework may be left in their mailboxes on the second floor of Brockman.)
TBD (@rice.edu) and TBD (@rice.edu)

Homework and Grades: We will assign a homework set each week, typically due at the beginning of class one week later. Homework sets will be assigned and distributed through the course web page on Canvas. This is not your only homework. Make sure you read the textbook and review notes. Using the rule of thumb of 2-3 hours of work outside lectures per credit hour (per week), plan for 8-12 hours per week for this course.

Homework and Exam Policy: Every homework assignment and exam is subject to the honor code. You are encouraged to discuss the homework problems with your PHYS 302 classmates and with the instructor and the grader(s), but you must write up your solutions *independently*. Of course, you must not copy anyone else's solutions.

You also may not consult previous year's homework or exam solutions or solutions from third party sources like the Internet.

Late Policy: The grade for late homework will be multiplied by a decaying exponential with a time constant of three days. Late homework must be delivered to the grader for that problem set and the student must write "Late" and the date and time on the front page. Homework late for more than 3 days is not accepted.

Grading Weights: Homework: 30%
Midterm Exam: 25%
Final Exam: 45%

Course Content
We plan to cover each of the twelve chapters in the textbook as follows, with more emphases on chapters 7-12:

1. Vector Analysis
2. Electrostatics
3. Potentials
4. Electric Fields in Matter
5. Magnetostatics
6. Magnetic Fields in Matter
7. Electrodynamics
8. Conservation Laws
9. Electromagnetic Waves
10. Potentials and Fields
11. Radiation
12. Electrodynamics and Relativity

Students with disabilities
If you have a documented disability that will impact your work in this class, please contact me to discuss your needs before or during the first week of class. Additionally, you will need to register with the Disability Support Services Office in the Ley Student Center.